ACT® International Subject Tests

International Subject Test—Biology Practice Test

The ACT® International Subject Test—Biology Practice Test is an official AIST practice test. The full-length Biology practice test consists of items drawn from the International Subject Test Biology formative assessment pool and adheres to the AIST Biology Test Specifications.

This pdf file includes Biology Practice Test questions and answer keys. Taking the AIST Official full-length practice test is the best way to prepare for the two sections of the AIST Biology test.

Biology

Part 1

45 Minutes—38 Questions

For each question, choose the best answer.

Your score will be based only on the number of questions you answer correctly during the time allowed. You will **not** be penalized for guessing. **It is to your advantage to answer every question even if you must guess.**

If you finish before time ends, you should use the time remaining to reconsider questions you are uncertain about.

1. Which of the following is a major difference between prokaryotic and eukaryotic cells?

   A. Only prokaryotes have nuclei.
   B. Only prokaryotes have photosynthetic pigments.
   C. Only eukaryotes have methods of locomotion.
   D. Only eukaryotes have membrane-bound organelles.

2. Which of the following best describes the appearance and movement of cardiac muscle tissue?

   A. Striated with voluntary movement
   B. Striated with involuntary movement
   C. Nonstriated with voluntary movement
   D. Nonstriated with involuntary movement

Please refer to the following passage to answer questions 3–5.

Lettuce seeds require light for germination. A biologist designed an experiment to study the effects of different wavelengths (colors) of light on the germination of a certain variety of light-sensitive lettuce seed. She placed filter paper in the bottom of each of 7 petri plates and moistened the paper with water. Then, she evenly distributed 100 lettuce seeds of the same variety over the filter paper in each plate and covered the plates with glass lids. Each plate received a different light color treatment—white, red, yellow, green, blue—or no light (darkness) for the same amount of time. The relative intensity of the light, the temperature (23°C), and the relative humidity (60%) remained constant. The biologist recorded her data in this table.

Seed Germination	
Light color treatment	# of seeds germinated
White	92
Red	91
Yellow	21
Green	25
Blue	29
No light	0

3. What is the independent variable in this experiment?

   A. Humidity
   B. Temperature
   C. Color of light
   D. Number of seeds germinated

4. Following proper scientific procedures, is it appropriate to include the white-light and no-light treatments, and why?

   A. Yes; white light is a control, and no light is a control.
   B. Yes; white light contains all colors of light, but darkness contains only black light.
   C. No; the experiment is about light so darkness is an unnecessary treatment.
   D. No; white light contains all colors, making it difficult to determine which color has an effect.

5. Which of the following statements is an appropriate interpretation of the data for this experiment?

   A. Blue light promotes germination more than red light.
   B. Green light stops production of a chemical that inhibits germination.
   C. Red light promotes germination more than yellow light.
   D. Lettuce seeds germinate at equal rates in all colors of light.

6. Breaking which type of bond would require the most energy?

- **A.** Covalent
- **B.** Electrostatic
- **C.** Hydrogen
- **D.** Intermolecular

7. By what process does a sodium ion exit a cell through the plasma membrane?

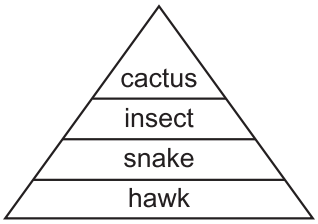
- **A.** Active transport
- **B.** Exocytosis
- **C.** Facilitated diffusion
- **D.** Osmosis

8. How do carbohydrates normally function within the human body?

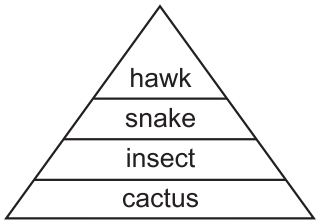
- **A.** As an energy source
- **B.** As the functional unit of fats
- **C.** As enzymes regulating metabolic processes
- **D.** As the primary component of cell membranes

9. Which energy pyramid accurately represents the amount of energy in a desert food chain including a cactus, a hawk, an insect, and a snake?

A.



C.



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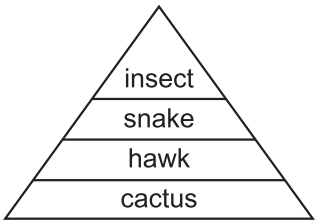
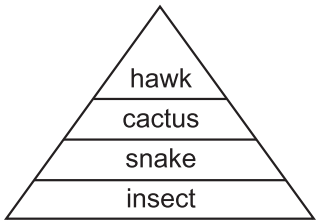
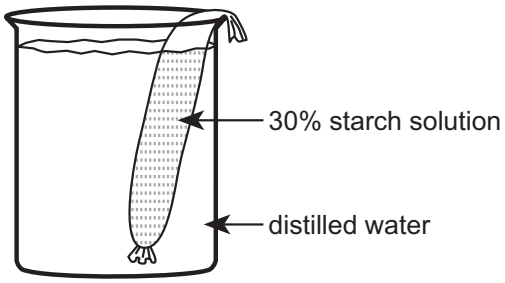


D.



10. In this figure, a dialysis bag containing a 30% starch solution is placed into a beaker of distilled water. The dialysis bag is permeable to water, but it is not permeable to starch. Which of the following statements concerning the initial movement of water molecules is correct?



A. More water molecules will move from the beaker of distilled water into the dialysis bag than in the opposite direction.

B. More water molecules will move from the dialysis bag into the beaker of distilled water than in the opposite direction.

C. Water molecules will not move through the dialysis bag.

D. Equal numbers of water molecules will move in both directions.

11. When classifying organisms based on similarities that reflect their evolutionary relationships, zoologists grouped together 3 of the organisms in this chart into one subphylum, while they placed each of the other organisms into separate phyla.

Organism Chart				
Common name	Breathing organs	Vertebral column	Skeleton type	Locomotion
Crab	gills	no	exoskeleton	walk/swim
Emu	lungs	yes	endoskeleton	walk/run
Jellyfish	none	no	none	swim
Octopus	gills	no	none	swim/crawl
Starfish	skin gills	no	endoskeleton	crawl
Trout	gills	yes	endoskeleton	swim
Whale	lungs	yes	endoskeleton	swim

Using your understanding of how organisms are classified and the information provided in the chart, which 3 organisms appear most closely related?

A. Octopus, trout, crab

B. Octopus, jellyfish, starfish

C. Whale, crab, starfish

D. Whale, emu, trout

Please refer to the following passage to answer questions 12–13.

Assume that in pea plants, round (*R*) seed shape is dominant to wrinkled (*r*), yellow (*Y*) seed color is dominant to green (*y*), and the genes for seed shape and seed color are unlinked.

12. For a class project, Tim needs to perform a cross that will produce results illustrating Mendel's law of independent assortment. What single cross will best demonstrate this law?

A. *RRYY* × *rryy*
B. *RRYY* × *RrYY*
C. *RrYY* × *RrYy*
D. *RrYy* × *RrYy*

13. If a plant with the genotype *RrYy* crosses with a plant with the genotype *rrYy*, what percent of the offspring are expected to be heterozygous for both traits?

A. 0%
B. 25%
C. 50%
D. 100%

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14. Biologists have linked the extinction of some amphibians to a pathogenic organism that infects their skin. During one stage of the pathogen's life cycle, it is motile and has a flagellum. The cell walls of the pathogen contain chitin, and mitochondria are present in the cells. How would biologists classify the organism, and why?

A. As a fungus, because its cell walls contain chitin
B. As a fungus, because it is pathogenic
C. As an animal, because its cells have flagella
D. As an animal, because it contains mitochondria

15. How does carbon-12 (mass number 12, atomic number 6) compare to carbon-14?

A. Carbon-12 has 8 more protons.
B. Carbon-12 has 8 more neutrons.
C. Carbon-12 has 2 fewer protons.
D. Carbon-12 has 2 fewer neutrons.

16. Who helped disprove the idea of spontaneous generation by demonstrating that maggots come from fly eggs and NOT from meat?

A. Francesco Redi
B. John Needham
C. Lazzaro Spallanzani
D. Louis Pasteur

17. Hummingbirds transfer pollen from one flower to another while feeding. What plant structure contains the pollen?

A. Carpel
B. Petal
C. Sepal
D. Stamen

18. When the pH in a stomach increases from 2 to 4, how does the hydrogen ion concentration change?

A. It increases by a factor of 2.
B. It increases by a factor of 100.
C. It decreases by a factor of 2.
D. It decreases by a factor of 100.

19. A base substitution mutation in a gene LEAST likely affects which characteristic?

A. The structure of a protein
B. The DNA's ability to replicate
C. The sequence of amino acids
D. The transcribed mRNA sequence

20. In aerobic respiration, glucose ($C_6H_{12}O_6$) combines with oxygen (O_2) to yield carbon dioxide (CO_2) and water (H_2O). What is the balanced chemical equation for this reaction?

A. $C_6H_{12}O_6 \rightarrow CO_2 + H_2O$
B. $C_6H_{12}O_6 + 6\ O_2 \rightarrow 6\ H_2O$
C. $C_6H_{12}O_6 + O_2 \rightarrow 6\ CO_2 + 6\ H_2O$
D. $C_6H_{12}O_6 + 6\ O_2 \rightarrow 6\ CO_2 + 6\ H_2O$

21. Suppose a mating of 2 rabbits resulted in $\frac{1}{4}$ of the offspring having black fur, $\frac{1}{2}$ of the offspring having gray fur, and $\frac{1}{4}$ of the offspring having white fur. The genotype of the black rabbits is *BB*. Which genotype and phenotype best describe both parental rabbits?

A. *BB*, black
B. *Bb*, gray
C. *bb*, gray
D. *bb*, white

22. The attraction between water molecules is an example of which of the following?

A. Adhesion
B. Cohesion
C. Evaporation
D. Transpiration

23. Despite the diversity of nature, most organisms contain the same 4 DNA bases. This table shows the DNA composition of 3 organisms as reported in a classic 1950s experiment.

Base Composition (percent)				
Organism	Adenine (A)	Guanine (G)	Thymine (T)	Cytosine (C)
Human	29	21	29	21
Wheat germ	27	23	27	23
E. coli	25	25	25	25

Based on this study, what did scientists conclude about the DNA composition of all organisms?

A. A, G, T, and C occur in equal percentages.
B. A and G occur in equal percentages, and T and C occur in equal percentages.
C. A and T occur in equal percentages, and G and C occur in equal percentages.
D. A and C occur in equal percentages, and T and G occur in equal percentages.

24. Dinosaur species dominated Earth for over 100 million years. During this time, most mammals were mouse-sized nocturnal organisms. Following the mass extinction of the dinosaurs, the small mammals rapidly diversified to fill available habitats and niches. What pattern of evolution best explains the diversification of mammals?

A. Catastrophism
B. Convergent evolution
C. Gradualism
D. Punctuated equilibrium

25. Hydrothermal vents are found on the ocean floor where hot, mineral-rich water escapes from cracks in Earth's crust. Bacteria near the vents do not require sunlight. Instead, they get energy by oxidizing hydrogen sulfide. Clams, shrimp, and giant tube worms consume these bacteria. These animals, in turn, are consumed by larger animals. Removing which of the following components from a hydrothermal vent ecosystem would most likely impose the greatest limit on ecosystem productivity?

A. Clams and shrimp
B. Hydrogen sulfide
C. Larger animals
D. Sunlight

26. Occasionally during meiosis, nondisjunction occurs and a homologous pair of chromosomes fails to separate. Which of the following effects could nondisjunction have on the products of meiosis?

A. One half of the gametes have 1 more chromosome than normal.
B. All of the gametes have 1 more chromosome than normal.
C. One quarter of the gametes have 1 less chromosome than normal.
D. All of the gametes have 1 less chromosome than normal.

27. Bryce is planning to plant tomatoes in his garden. He wants to determine if tomato seeds will germinate (sprout) faster in soil with sugar added than in soil with no sugar added. He plants one seed in 100 grams of soil in each of 20 pots.

Which experiment will give him the most useful results?

A. Placing 5 grams of sugar in all 20 pots, then giving 10 pots 40 mL of water daily and the other 10 pots 80 mL of water daily
B. Placing 5 grams of sugar in 10 pots and 10 grams of sugar in the other 10 pots, then giving all 20 pots 40 mL of water daily
C. Placing 5 grams of sugar in 10 pots and no sugar in the other 10 pots, then giving all 20 pots 40 mL of water daily
D. Placing 5 grams of sugar in 10 pots and no sugar in the other 10 pots, then giving the 10 pots with sugar 40 mL of water daily and the 10 pots without sugar 80 mL of water daily

28. Molecule M is a carbohydrate composed of several hundred glucose units. What type of molecule is Molecule M?

A. Disaccharide
B. Monosaccharide
C. Oligosaccharide
D. Polysaccharide

29. Horses born to 2 palomino (golden-coated) horses have a 25% chance of having a white coat, a 25% chance of having a chestnut (brown) coat, and a 50% chance of having a palomino coat. Which description of inheritance best explains the coat-color trait in these horses?

A. Palomino coat color is a recessive trait.
B. Palomino coat color is a dominant trait.
C. Coat color is an incompletely dominant trait.
D. Coat color is a sex-linked trait.

30. What is the correct order of organization of all living things from simplest to most complex?

A. Atom, cell, organ, organelle, organ system, organism, molecule, tissue
B. Atom, molecule, organelle, cell, tissue, organ, organ system, organism
C. Atom, molecule, cell, tissue, organelle, organ, organism, organ system
D. Organelle, atom, molecule, cell, tissue, organ, organ system, organism

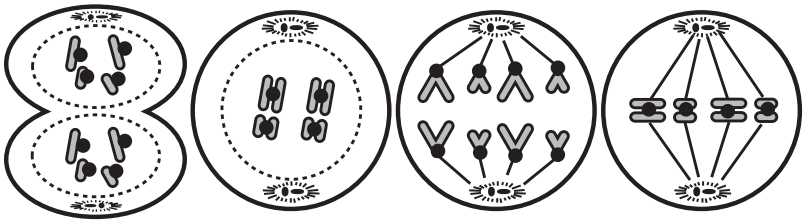
31. A small bilaterally symmetric adult organism recovered from the tissue of a pig contains muscles and a thick external cuticle. This organism does NOT have segments, appendages, or a chitinous exoskeleton. To which of the following phyla does this organism belong?

A. Arthropoda
B. Chordata
C. Echinodermata
D. Nematoda

32. Why are organic molecules so diverse?

A. They form mirror images of each other.
B. They contain oxygen, which has 6 valence electrons.
C. They form when any naturally occurring elements combine.
D. They have carbon skeletons that vary greatly in arrangement.

33. These diagrams represent different stages of animal cell division.



1 2 3 4

From start to finish, what is the correct order of the stages?

A. 2, 4, 3, 1
B. 2, 3, 4, 1
C. 3, 2, 1, 4
D. 3, 1, 2, 4

34. One form of anhidrotic ectodermal dysplasia (AED) is an X-linked recessive condition. Which male and female would be most likely to have children with these expected results regarding AED: half the sons have AED and none of the daughters have AED?

A. Male without AED and homozygous dominant female
B. Male without AED and female AED carrier
C. Male with AED and homozygous dominant female
D. Male with AED and homozygous recessive female

35. The sequence

AUGGGAAGCCCACGUUUCCAAUGC

represents a sequence of mRNA coded from a gene. Use this codon chart to determine the resulting amino acid sequence.

1st position	2nd position U	C	A	G	3rd position
U	Phe	Ser	Tyr	Cys	U
	Phe	Ser	Tyr	Cys	C
	Leu	Ser	Stop	Stop	A
	Leu	Ser	Stop	Trp	G
C	Leu	Pro	His	Arg	U
	Leu	Pro	His	Arg	C
	Leu	Pro	Gln	Arg	A
	Leu	Pro	Gln	Arg	G
A	Ile	Thr	Asn	Ser	U
	Ile	Thr	Asn	Ser	C
	Ile	Thr	Lys	Arg	A
	Met	Thr	Lys	Arg	G
G	Val	Ala	Asp	Gly	U
	Val	Ala	Asp	Gly	C
	Val	Ala	Glu	Gly	A
	Val	Ala	Glu	Gly	G

A. Arg–Asn–Leu–Cys–Thr–Arg–Arg–Val

B. Met–Gly–Ser–Pro–Arg–Phe–Gln–Cys

C. Ala–Leu–Glu–Thr–Trp–Ala–Ser–His

D. Tyr–Pro–Ser–Gly–Ala–Lys–Val–Thr

36. Which of the following statements accurately describes a difference between bacteria and viruses?

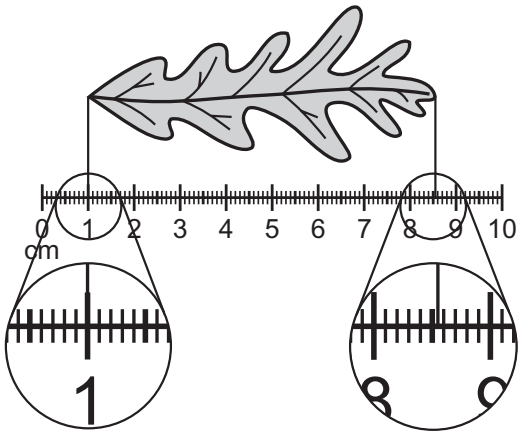
A. Bacteria do not have DNA, but viruses do.

B. Viruses are acellular, but bacteria are not.

C. Bacteria have a membrane-bound nucleus, but viruses do not.

D. Viruses can infect humans, but bacteria cannot.

37. In Biology class, Jamal uses a metric ruler to measure the length of a leaf. Which of the following measurements reflects the precision of the ruler Jamal uses to measure the leaf?



A. 8 cm
B. 7.5 cm
C. 7.53 cm
D. 7.531 cm

38. The heart, kidney, stomach, and thyroid all belong to different organ systems in the body. Which of the following correctly matches the organ with its function?

A. Heart; filters waste from blood
B. Kidney; filters waste from blood
C. Stomach; produces bile
D. Thyroid; produces bile

International Subject Test—Biology Practice Test

Part 1 Answer Key

The following table contains the question number and the correct answer (key) for each question in Part 1 of this pdf file.

1	D
2	B
3	C
4	A
5	C
6	A
7	A
8	A
9	C
10	A
11	D
12	D
13	B
14	A
15	D
16	A
17	D
18	D
19	B

20	D
21	B
22	B
23	C
24	D
25	B
26	A
27	C
28	D
29	C
30	B
31	D
32	D
33	A
34	B
35	B
36	B
37	C
38	B

Biology

Part 2

45 Minutes—38 Questions

For each question, choose the best answer.

Your score will be based only on the number of questions you answer correctly during the time allowed. You will **not** be penalized for guessing. **It is to your advantage to answer every question even if you must guess.**

If you finish before time ends, you should use the time remaining to reconsider questions you are uncertain about.

1. Which of the following statements best describes a recessive allele?

A. It produces the least common phenotype.
B. It produces the most common phenotype.
C. Its phenotype is not expressed in heterozygotes.
D. Its phenotype is expressed in heterozygotes.

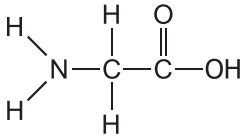
2. Which of the following parts of the human digestive system is an accessory organ or accessory structure?

A. Esophagus
B. Stomach
C. Large intestine
D. Pancreas

3. While studying a small pond, Rolanda identified soft mud, *Elodea* plants, cattail plants, water, mosquito fish, mosquitoes, small rocks, and dragonflies. The community Rolanda studied includes which of the following?

A. Water
B. Dragonflies
C. Small rocks
D. Soft mud

4. This molecule is an example of which substance?



A. Amino acid
B. Carbohydrate
C. Fatty acid
D. Nucleotide

5. A researcher counted the number of eggs a single fruit fly laid in 24 hr for 5 days and recorded the findings in this table.

Day	Number of eggs
1	10
2	14
3	7
4	8
5	11

What is the average number of eggs laid per day over the 5 days?

A. 5
B. 10
C. 25
D. 50

6. The stomata and guard cells of a plant and the alveoli tissue of a mammal have which primary function in common?

A. Gas exchange
B. Hormone production
C. Temperature regulation
D. Mineral storage

7. Given that radish plants do not self-pollinate and rely mainly on insects to transfer pollen from plant to plant, which of the following are radish plants unable to produce on their own?

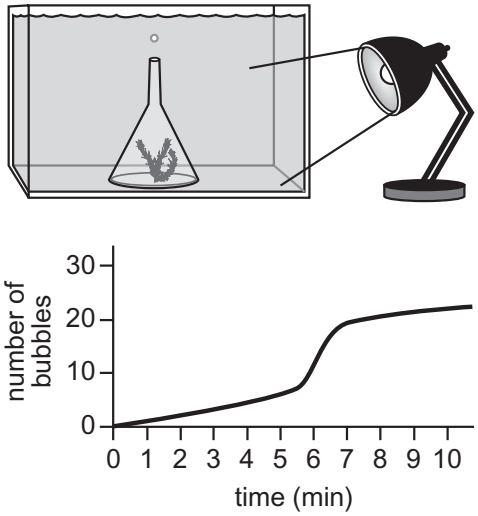
A. Eggs
B. Flowers
C. Pollen
D. Seeds

8. Which is the best example of a population?

A. All the insects in North America
B. All the white-tailed deer on an island
C. All the bacteria in a person's digestive tract
D. All the single-celled creatures in a sample of pond water

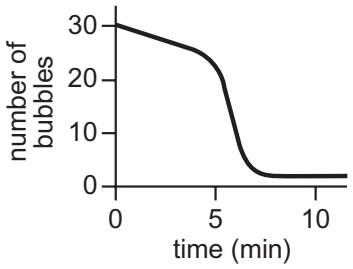
9. Lars inserted *Elodea*, a common aquarium plant, under an inverted glass funnel and placed the funnel under water in a clear glass tank. He turned out the room lights and then directed a white-light lamp at the funnel. After a few minutes, small bubbles formed and escaped out of the funnel's stem. Lars counted the bubbles to estimate the rate of photosynthesis. He plotted his results in this graph.

***Elodea* Photosynthesis Experiment**

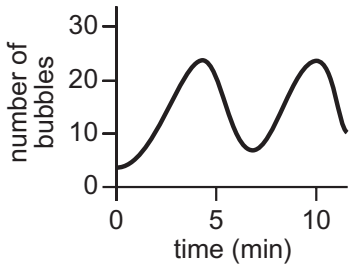


Lars repeated this experiment replacing a white-light lamp with a red-light lamp. Which of the following graphs would most likely represent his resulting data?

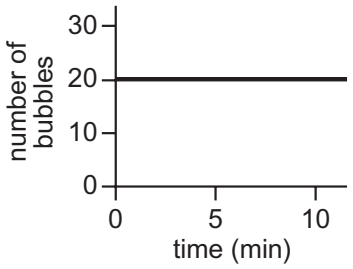
A.



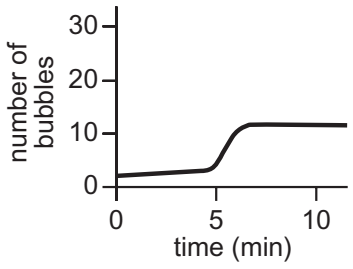
C.



B.



D.



10. A scientist places a cell in a solution, and over time the cell gains mass and swells. What is the most likely explanation for the cell's gain in mass?

A. The solution is hypertonic to the cell.
B. The solution is hypotonic to the cell.
C. The solution and the cell have equal concentrations of solutes.
D. The solution and the cell have equal concentrations of water.

11. What causes a trisomy condition, such as Down syndrome?

A. A base pair deletion mutation
B. A base pair substitution mutation
C. The inheritance of dysfunctional tRNA
D. The inheritance of an extra chromosome

12. Robin measured the growth rate of 5 mice by periodically determining the mass of each mouse. She recorded the data in this table.

Body Mass of Mice during First 120 Days of Life

Mouse number	Mass (g) at specified age						
	Birth	10 days	20 days	30 days	60 days	90 days	120 days
1	1.1	2.0	3.1	4.6	12.4	23.7	25.3
2	1.2	2.4	3.2	4.7	12.7	24.0	26.1
3	1.1	2.5	3.8	5.3	13.8	25.1	27.3
4	0.9	1.9	2.8	4.4	13.4	24.5	27.0
5	1.2	2.4	3.5	5.1	13.3	24.6	26.5
Mean	1.1	2.2	3.3	4.8	13.1	24.4	26.4

On average, during which of the following time periods did the mice gain the most mass (in grams)?

A. Birth–10 days
B. 20–30 days
C. 60–90 days
D. 90–120 days

13. Suppose a carbon dioxide molecule leaves a respiring muscle cell in the leg and is transported in the blood to the lungs. After this carbon dioxide molecule leaves the respiring cell it travels through each of the following structures.

1. Heart
2. Systemic vein
3. Alveolar capillaries
4. Pulmonary artery
5. Capillaries near muscle cell

In what order does this carbon dioxide molecule most likely encounter these structures?

A. 5, 2, 3, 1, 4
B. 5, 2, 1, 4, 3
C. 5, 4, 1, 2, 3
D. 5, 4, 3, 1, 2

14. What is the primary factor that determines the polarity of a bond between atoms?

A. The total number of electrons involved in the bond
B. The total number of protons and neutrons in both atoms
C. The difference in the relative attraction of electrons to each atom
D. The difference in the relative attraction of protons to each atom

15. What DNA sequence complements this sequence?

A C T T T G G A T C

A. A C T T T G G A T C
B. T G A A A C C T A G
C. T G U U U C C T U G
D. U G A A A C C U A G

16. Which statement best explains how penicillin, a common antibiotic, stops the growth of certain bacteria?

A. It inhibits production of the protein coat.
B. It inhibits replication of DNA.
C. It inhibits synthesis of bacterial walls.
D. It inhibits formation of spores.

17. What level of the biological taxa includes Chordata, Mollusca, Echinodermata, Arthropoda, and Cnidaria?

A. Family
B. Genus
C. Kingdom
D. Phylum

18. Trait X is a dominant trait in humans. A man with Trait X, whose mother did not have Trait X, plans to have a child with a woman without Trait X. What is the percent chance that the child will inherit Trait X?

A. 0%
B. 25%
C. 50%
D. 100%

19. Louise places 1 bacterium in a Petri dish at time 0 hr. The population increases exponentially, doubling every hour, and there are no limiting factors. How many bacteria will be in the Petri dish after 6 hr?

A. 6
B. 16
C. 32
D. 64

20. When cells hydrolyze ATP, releasing energy, which of the following bonds in the ATP molecule is typically broken?

A. The bond between 2 phosphate groups
B. The bond between ribose and a phosphate group
C. The bond between adenine and ribose
D. The bond between adenine and a phosphate group

21. Persons A and B have similar mRNA sequences with the exception of 1 nucleotide.

Person A: AUGGUUACUAAGGGCUGA

Person B: AUGGUUACUGAGGGCUGA

Use the genetic code chart to determine how this difference affects the sequence of amino acids in the resulting protein.

1st position	2nd position U	C	A	G	3rd position
U	Phe	Ser	Tyr	Cys	U
	Phe	Ser	Tyr	Cys	C
	Leu	Ser	Stop	Stop	A
	Leu	Ser	Stop	Trp	G
C	Leu	Pro	His	Arg	U
	Leu	Pro	His	Arg	C
	Leu	Pro	Gln	Arg	A
	Leu	Pro	Gln	Arg	G
A	Ile	Thr	Asn	Ser	U
	Ile	Thr	Asn	Ser	C
	Ile	Thr	Lys	Arg	A
	Met	Thr	Lys	Arg	G
G	Val	Ala	Asp	Gly	U
	Val	Ala	Asp	Gly	C
	Val	Ala	Glu	Gly	A
	Val	Ala	Glu	Gly	G

A. Lys in Person A is replaced with Glu in Person B.

B. Phe in Person A is replaced with Leu in Person B.

C. Persons A and B have identical amino acid sequences.

D. A stop codon is generated in Person B and not in Person A.

22. Ang and Madison find a brown oval-shaped object in the sand at the seashore. They place it in a shallow tray with sand and seawater. Which of the following observations provides the best evidence that the object is alive?

A. The object shows radial symmetry.

B. The object burrows into the sand when touched.

C. There are similar objects of various sizes on the beach.

D. The object has 2 dark spots near 1 end.

23. What did James Watson and Francis Crick determine about DNA?

A. DNA contains approximately equal amounts of adenine and cytosine.

B. DNA has a double-helical structure connected by paired bases.

C. DNA is the genetic material of all types of cells.

D. DNA replicates in a conservative process.

24. These animals are all placed in the vertebrate class Amphibia and the order Anura.

- wood frog, *Rana sylvatica*
- bullfrog, *Rana catesbeiana*
- western toad, *Bufo boreas*
- spadefoot toad, *Scaphiopus hammondi*

What is the most likely conclusion about the evolutionary relationship between or among these organisms?

A. The wood frog and bullfrog are better jumpers than the western toad and the spadefoot toad.

B. The wood frog and bullfrog share a more recent common ancestor than do the western toad and the spadefoot toad.

C. The western toad and the spadefoot toad share a more recent common ancestor than do the wood frog and the bullfrog.

D. The western toad and the spadefoot toad both evolved in western North America, while the wood frog and the bullfrog evolved in the tropics.

25. Horse skeleton fossils indicate that the size of horses increased over time. Which statement best explains this fossil record?

A. Smaller horses bred with larger horses, creating hybrids.

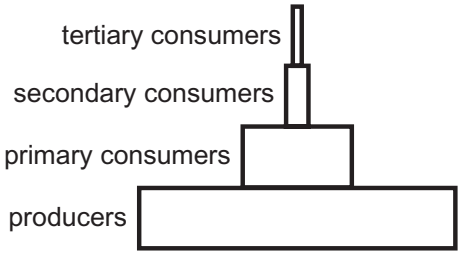
B. Smaller horses became extinct early in their history.

C. Larger horses consumed the food supply of the smaller horses.

D. Larger horses produced a slightly greater number of surviving offspring.

26. Suppose transfer efficiency represented within this energy pyramid is 10% between all levels.

Pyramid of Energy



If the producer level contains 10,000 units of energy, how many units of energy will the tertiary consumer level contain?

A. 1

B. 10

C. 100

D. 1,000

27. Which of these types of molecules is composed of a 5-carbon sugar (pentose), phosphate group, and nitrogenous base?

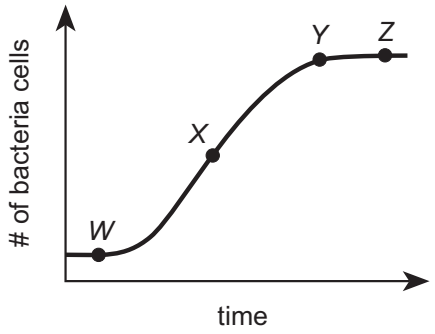
A. Amino acid
B. Fatty acid
C. Monosaccharide
D. Nucleotide

28. In peas, tall plant height (*T*) is dominant to short plant height (*t*), and purple flower color (*P*) is dominant to white flower color (*p*). Dr. Bauman crosses a tall, purple-flowered plant with a short, white-flowered plant. The F_1 generation consists of all tall plants with purple flowers. What genotypes most likely represent the parents?

A. *TTPP* and *ttpp*
B. *TTPp* and *TtPp*
C. *TtPp* and *ttpp*
D. *TTPP* and *TTPP*

29. A biologist monitors the growth of a bacterial population over time. This graph reflects the data collected by the biologist.

Growth Curve for Bacterial Population



At which of the four points in time (*W*, *X*, *Y*, or *Z*) indicated on the graph is the growth rate of the total population the greatest?

A. Point *W*
B. Point *X*
C. Point *Y*
D. Point *Z*

30. Which statement most accurately describes the induced fit model of enzyme function?

A. Substrate binding does not depend on the shape of the active site.
B. Competitive inhibitors block the substrate from the active site.
C. Substrate binding slightly changes the shape of the enzyme.
D. An enzyme creates a permanent bond with the substrate.

31. The organisms of what kingdom possess these traits?

- They have eukaryotic cells.
- They are photosynthetic.
- They have cellulose cell walls.

A. Eubacteria
B. Fungi
C. Plantae
D. Monera

32. In coho salmon, hooknose males are large, and jack males are small. Average-sized males exist, but they are rare. What statement best explains disruptive selection in male coho salmon?

A. Average-sized males reach the spawning ground first.
B. The scent of average-sized males makes them most attractive to females.
C. Hooknose males produce stronger sperm than jack males or average-sized males.
D. The relative size of hooknose males and jack males is an advantage during mating.

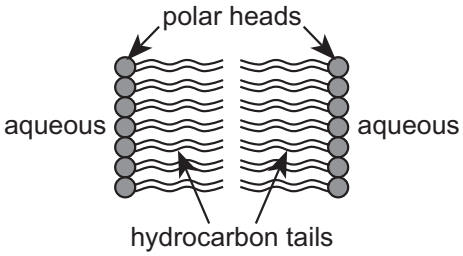
33. Sam finds out that the concentration of glucose in his blood is approximately 10 times greater than the concentration of glucose in certain cells in his body. The process by which glucose enters these cells from his bloodstream is best described by which of the following?

A. Active transport
B. Facilitated diffusion
C. Osmosis
D. Glycolysis

34. The producers and consumers of an ecosystem represent which type of factors?

A. Biotic
B. Climatic
C. Secondary
D. Territorial

35. Which of the following is a function of the structure represented below?



A. To provide the mechanism for protein synthesis
B. To provide a hydrophobic outer surface
C. To act as an impermeable barrier to all substances
D. To act as a selectively permeable barrier

36. Many orchids live in tropical rainforests high in the forks of tree branches. They receive water and nutrients that fall from the trees' upper leaves. However, their roots do not penetrate the trees, and they provide no benefit to the trees. What kind of ecological interaction is this?

A. Commensalism
B. Competition
C. Mutualism
D. Parasitism

37. In which of the following cellular organelles does protein synthesis occur?

A. Centriole
B. Lysosome
C. Nucleus
D. Ribosome

38. Which of the following structures maintains the shape of plant cells?

A. Cell wall
B. Lysosome
C. Mitochondrion
D. Chloroplast

International Subject Test—Biology Practice Test

Part 2 Answer Key

The following table contains the question number and the correct answer (key) for each question in Part 2 of this pdf file.

1	C
2	D
3	B
4	A
5	B
6	A
7	D
8	B
9	D
10	B
11	D
12	C
13	B
14	C
15	B
16	C
17	D
18	C
19	D

20	A
21	A
22	B
23	B
24	B
25	D
26	B
27	D
28	A
29	B
30	C
31	C
32	D
33	B
34	A
35	D
36	A
37	D
38	A